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| 10/532,980 | 10/21/2005 | Hajime Tanaka | 271353US0PCT | 3023 |
| 22850 | 7590 | 04/03/2008 | | |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | EXAMINER PERRY, ANTHONY T | |
| | | | ART UNIT 2879 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/532,980 | Applicant(s) TANAKA ET AL. | |
| | Examiner ANTHONY T. PERRY | Art Unit 2879 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-11, 13-20, 22-24, 27, 29 and 30 is/are rejected.
- 7) ☒ Claim(s) 5, 12, 21, 25, 26 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/28/05, 7/13/05, 7/13/06, 5/15/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claims 5, 12, and 21 are objected to because of the following informalities:

Regarding claim 5:

In line 2, replace “when” with --wherein--.

In line 6, delete “.”.

In line 10 remove “(“ and ”)”.

At the end of line 10, add --,--.

Regarding claim 12:

In line 2, replace “when” with --wherein--.

In line 6, delete “.”.

In line 10 remove “(“ and ”)”.

At the end of line 10, add --,--.

Regarding claim 21:

In line 2, replace “when” with --wherein--.

In line 6, delete “.”.

In line 10 remove “(“ and ”)”.

At the end of line 10, add --,--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 6, 9, 13, 15, 18, 22, 24, 27, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al. (WO 02/37522).

Citations are made using US Patent Number 6,833,663 which is in the same patent family as WO 02/37522.

Regarding claim 1, Tanaka et al disclose a metal back-attached phosphor screen, comprising a phosphor layer (2) and a metal back layer (3) on an inner surface of a face plate, wherein a first treatment layer containing an oxide of one kind or two or more kinds of elements selected from the group consisting of silicon, aluminum, titanium, and zirconium is formed on the phosphor layer and the metal back layer is formed on the first treatment layer (for example, see Fig. 1 and col. 5, lines 51-60).

Regarding claim 6, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 1, further comprising a second treatment layer containing an oxide of one kind or two or more kinds of elements selected from the group consisting of silicon, aluminum, titanium, and zirconium on the metal back layer (for example, see col. 6, lines 26-33).

Regarding claim 9, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 1, further comprising a second treatment layer containing one kind or two or more kinds of inorganic oxides selected from the group consisting of silicon oxide, a silicon oxide

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containing one kind or two or more kinds of alkali metal elements, aluminum oxide, titanium oxide, and zirconium oxide on the metal back layer (for example, see col. 6, lines 26-33).

Regarding claim 13, Tanaka discloses a metal back-attached phosphor screen comprising a phosphor layer (2) and a metal back layer (3) on an inner surface of a face plate, wherein a first treatment layer containing one kind or two or more kinds of inorganic oxides selected from the group consisting of silicon oxide, a silicon oxide containing one kind or two or more kinds of alkali metal elements, aluminum oxide, titanium oxide, and zirconium oxide is formed on the phosphor layer and the metal back layer is formed on the first treatment layer (for example, see Fig. 1 and col. 5, lines 51-60).

Regarding claim 15, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 13, further comprising a second treatment layer containing an oxide of one kind or two or more kinds of elements selected from the group consisting of silicon, aluminum, titanium, and zirconium on the metal back layer (for example, see col. 6, lines 26-33).

Regarding claim 18, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 13, further comprising a second treatment layer containing one kind or two or more kinds of inorganic oxides selected from the group consisting of silicon oxide, a silicon oxide containing one kind or two or more kinds of alkali metal elements, aluminum oxide, titanium oxide, and zirconium oxide on the metal back layer (column 6, lines 26-33).

Regarding claim 22, Tanaka discloses a method of forming a metal back-attached phosphor screen comprising: forming a phosphor layer (2) on an inner surface of a face plate (1); forming a first treatment layer containing an oxide of one kind or two or more kinds of elements selected from the group consisting of silicon, aluminum, titanium, and zirconium on the

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phosphor layer; and forming a metal back layer (3) on the first treatment layer (for example, see Fig. 1 and col. 5, lines 51-60).

Regarding claim 24, Tanaka discloses a method of forming a metal back-attached phosphor screen comprising: forming a phosphor layer (2) on an inner surface of a face plate (1); forming a first treatment layer containing one kind or two or more kinds of inorganic oxides selected from the group consisting of silicon oxide, a silicon oxide containing one kind or two or more kinds of alkali metal elements, aluminum oxide, titanium oxide, and zirconium oxide on the phosphor layer; and forming a metal back layer (3) on the first treatment layer (for example, see Fig. 1 and col. 5, lines 51-60).

Regarding claim 27, Tanaka discloses the method of forming a metal back-attached phosphor screen as set forth in claim 24, further comprising forming a second treatment layer containing one kind or two or more kinds of inorganic oxides selected from the group consisting of silicon oxide, a silicon oxide containing one kind or two or more kinds of alkali metal elements, aluminum oxide, titanium oxide, and zirconium oxide on the metal back layer (for example see col. 5, lines 55-56 and col. 6, lines 26-33).

Regarding claim 30, Tanaka discloses an image display device comprising: a face plate (19); a rear plate (15) disposed facing the face plate; numerous electron emitting elements (17) formed on the rear plate; and a phosphor screen (20) formed on the face plate in such a way as to face the rear plate and emitting light by electron beams emitted from the electron emitting elements, the phosphor screen being a metal back-attached phosphor screen (for example, see Fig. 7 and col. 7, lines 59-60).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-4, 7, 7, 8, 10, 11, 14, 16, 17, 19, 20, 23, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (WO 02/37522).

Again, citations are made using US Patent Number 6,833,663 which is in the same patent family as WO 02/37522.

Regarding claim 2, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 1, but does not specifically state that the oxide in the first treatment layer contains one kind or two or more kinds of alkali metal elements. Tanaka does, however, teach that other elements can be used (for example, see col. 6, lines 26-29). It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have included an alkali metal element within the treatment layer, since the selection of known materials for a known purpose is within the skill of the art.

Regarding claim 3, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 1, but does not specifically teach a content of the oxide in the first treatment layer is 2 wt % to 20 wt % of a content of a phosphor in the phosphor layer. However, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. It would have been obvious to

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one having ordinary skill in the art at the time the invention was made to provide an appropriate range for the content of the oxide included in the treatment layer, since optimization of workable ranges is considered within the skill of the art.

Regarding claim 4, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 1, wherein the first treatment layer contains silicon dioxide and titanium oxide (for example, See col. 6, lines 26-33), but does not specifically disclose that the first treatment layer also contains zirconium oxide. However, Tanaka does state that the treatment layer may contain silicon dioxide, titanium oxide, "or the like". It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have realized that zirconium oxide would be an acceptable oxide to include in the treatment layer, since the selection of known materials for a known purpose is within the skill of the art.

Regarding claim 7, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 6, but does not specifically state that the oxide in the first treatment layer contains one kind or two or more kinds of alkali metal elements. Tanaka does, however, teach that other elements can be used (for example, see col. 6, lines 26-29). It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have included an alkali metal element within the treatment layer, since the selection of known materials for a known purpose is within the skill of the art.

Regarding claims 8, 10, 17, and 19, Tanaka does not specifically recite the content of the oxide in the second treatment layer, as a component weight per unit area of the metal back layer, being $4 \mu\text{g}/\text{cm}^2$ to $40 \mu\text{g}/\text{cm}^2$. However, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an appropriate range for the content of the oxide in the second treatment layer, since optimization of workable ranges is considered within the skill of the art.

Regarding claim 11, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 1, wherein the first treatment layer contains silicon dioxide and titanium oxide (for example, See col. 6, lines 26-33), but does not specifically disclose that the first treatment layer also contains zirconium oxide. However, Tanaka does state that the treatment layer may contain silicon dioxide, titanium oxide, "or the like". It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have realized that zirconium oxide would be an acceptable oxide to include in the treatment layer, since the selection of known materials for a known purpose is within the skill of the art.

Regarding claim 14, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 1, but does not specifically teach a content of the inorganic oxide in the first treatment layer is 2 wt % to 20 wt % of a content of a phosphor in the phosphor layer. However, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. It would have

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been obvious to one having ordinary skill in the art at the time the invention was made to provide an appropriate range for the content of the oxide included in the treatment layer, since optimization of workable ranges is considered within the skill of the art.

Regarding claim 16, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 6, but does not specifically state that the oxide in the second treatment layer contains one kind or two or more kinds of alkali metal elements. Tanaka does, however, teach that other elements can be used (for example, see col. 6, lines 26-29). It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have included an alkali metal element within the second treatment layer, since the selection of known materials for a known purpose is within the skill of the art.

Regarding claim 20, Tanaka discloses the metal back-attached phosphor screen as set forth in claim 1, wherein the first treatment layer contains silicon dioxide and titanium oxide (for example, See col. 6, lines 26-33), but does not specifically disclose that the first treatment layer also contains zirconium oxide. However, Tanaka does state that the treatment layer may contain silicon dioxide, titanium oxide, "or the like". It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have realized that zirconium oxide would be an acceptable oxide to include in the treatment layer, since the selection of known materials for a known purpose is within the skill of the art.

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Regarding claim 23, Tanaka discloses the method of forming a metal back-attached phosphor screen as set forth in claim 22, but does not specifically state that the oxide in the second treatment layer contains one or more kinds of alkali metal elements. Tanaka does, however, teach that other elements can be used (for example, see col. 6, lines 26-29). It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have included an alkali metal element within the second treatment layer, since the selection of known materials for a known purpose is within the skill of the art.

Regarding claim 29, Tanaka discloses the method of forming a metal back-attached phosphor screen as set forth in claim 27, but does not specifically state that the SiO_x layer is formed by a sputtering method while a Si target is thermal sprayed with oxygen introduced. However, such a method is conventional in the art of depositing silicon dioxide layers. It has been held to be within the general skill of a worker in the art to select a known method of depositing a specific layer on the basis of its suitability for the intended use as a matter of obvious design choice. Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have used known method of depositing silicon dioxide, involving sputtering using an Si target in an oxygen atmosphere, since the selection of known depositing methods for known materials is within the skill of the art.

Allowable Subject Matter

Claims 5, 12, 21, 25, 26, and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to disclose or fairly suggest:

- A metal back phosphor screen containing oxides of silicon, titanium, and zirconium in the first treatment layer, wherein the percentages by weight satisfy: $70 \leq x_1 + y_1 < 100$; $x_1 + 0.5y_1 \leq 80$; $x_1 + y_1 + z_1 = 100$; $x_1 > 0$; $y_1 > 0$; and $z_1 > 0$), wherein x_1 is the percentage of silicon dioxide, y_1 is the percentage of titanium oxide, and z_1 is zirconium oxide in combination with the remaining claimed limitations as called for in claim 5.
- A metal back phosphor screen containing oxides of silicon, titanium, and zirconium in the second treatment layer, wherein the percentages by weight satisfy: $70 \leq x_2 + y_2 < 100$; $x_2 + 0.5y_2 \leq 80$; $x_2 + y_2 + z_2 = 100$; $x_2 > 0$; $y_2 > 0$; and $z_2 > 0$, wherein x_2 is the percentage of silicon dioxide, y_2 is the percentage of titanium oxide, and z_2 is the percentage of zirconium oxide in the second treatment layer in combination with the remaining claimed limitations as called for in claim 12.
- A metal back phosphor screen containing oxides of silicon, titanium, and zirconium in the second treatment layer, wherein the percentages by weight satisfy: $70 \leq x_2 + y_2 < 100$; $x_2 + 0.5y_2 \leq 80$; $x_2 + y_2 + z_2 = 100$; $x_2 > 0$; $y_2 > 0$; and $z_2 > 0$, wherein x_2 is the percentage of silicon dioxide, y_2 is the percentage of titanium oxide, and z_2 is the percentage of zirconium oxide in the second treatment layer, in combination with the remaining claimed limitations as called for in claim 21.

- The method of forming metal back-attached phosphor including the step of applying/drying a solution containing a component which produces the inorganic oxide by heating with water as a main solvent to form a lower coating film on the phosphor layer; applying/drying a solution containing a component which produces the inorganic oxide by heating with an organic solvent as a main solvent to form an upper coating film on the lower coating film; and heating a coating film in which the lower coating film and the upper coating film are stacked to form a layer mainly composed of the inorganic oxide, in combination with the remaining claimed limitations as called for in claim 25.
- The method of forming metal back-attached phosphor including the step of hydrolyzing and polymerizing alkoxide containing at least one kind of element selected from the group consisting of silicon (Si), titanium (Ti), and zirconium (Zr) in a solution; applying/drying a solution containing oligomer obtained in hydrolyzing and polymerizing to form a coating film; and heating the coating film to form a layer mainly composed of the inorganic oxide, in combination with the remaining claimed limitations as called for in claim 26.
- The method of forming metal back-attached phosphor including the step of hydrolyzing and polymerizing alkoxide containing at least one kind of element selected from the group consisting of silicon (Si), titanium (Ti), and zirconium (Zr) in a solution; applying/drying a solution containing oligomer obtained in hydrolyzing and polymerizing to form a coating film; and heating the coating film to form a layer mainly composed of the inorganic oxide, in combination with the remaining claimed limitations as called for in claim 28.

Other Prior Art Cited

The prior art made of record and not relied upon, of Ito et al. (US 7,074,100) and Porter et al. (US 6,812,636) is considered pertinent to applicant's disclosure.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to *Anthony Perry* whose telephone number is **(571) 272-2459**. The examiner can normally be reached between the hours of 9:00AM to 5:30PM Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-2457. **The fax phone number for this Group is (571) 273-8300.**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Anthony Perry/

Anthony Perry
Patent Examiner
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March 30, 2008

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/Nimeshkumar Patel/

Supervisory Patent Examiner, Art Unit 2879